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Incident #198 -- Wakkanai, Japan -- 6 November 1948

This incident has no astronomical explanation.

The object has been independently identified from radar information as a Soviet aircraft.

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Incident #199 -- near Grays Harbor, Washington -- 30 October 1948

From the meager information given by Lieutenant Kunzman, presumably a responsible and well-trained observer, positive identification of the object is impossible, but it appears likely that it was a bursting fireball.

The bits of evidence that tend toward this interpretation are the following: one object bursting into ten or twenty pieces, color white and yellow, and the short time in sight. Manner of disappearance, simply fading from view "like fumes from an airplane," is also similar to that of a disintegrating fireball. In bright daylight the otherwise bright, flare-like quality is sometimes not observed.

Against this interpretation are the following: no lights or outstanding reflection, and no trail. The former might be the result of bright daylight. Obviously the objects were observed, and if they were yellow and white, they must have had some luminosity. Lack of trail is, however, unusual.

Unfortunately, without more detailed information, little more can be said.

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Incident #220 -- San Francisco, California -- 29 November 1948

There is good reason to believe that the object observed in this incident was a bolide. The fact that the observer, although a science teacher, confused the term comet with meteor is strong evidence that he is unacquainted with these phenomena: a comet appears stationary in the sky over a relatively long period of time. While the evidence is insufficient to establish with any certainty that the object was a bolide, it appears to this investigator, none the less, to be the most probable explanation.

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Incident #221 -- Midland, Michigan -- 9 July 1947

From the chemical analysis (as reported in this incident) of the material turned in to the laboratory, it is evident that there is no astronomical explanation for the object. Meteorites do not include in their contents silver pellets or magnesium hydroxide.

This incident was evidently a prank or a private experiment. (Observer may or may not have been the instigator.) Since the event occurred on July 9, it is possible that chemicals left over from a Fourth of July celebration were used; the magnesium content might imply this.

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Incident #222 -- Furstenfeldbruck, Germany -- 26 November 1948

The tactics described by this object, if correct, and the implied time in sight (long enough to call others to see it) argue strongly against an astronomical interpretation for the incident.

The object might have been a balloon with a light on it.

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Incident #223, a-e -- New Mexico -- 5 December 1948

Since several separate sightings are encompassed by incident #223 to 223e, it must be regarded as a composite incident, occurring during one night but referring to several distinct phenomena. The reports in #223 appear in turn to be a part of a larger series of incidents, all concerned with the "green meteors" or "green flashes" which have appeared in and near New Mexico, and the present statement applies to some degree to all of them.

In his letter of December 29, 1948, to Lieutenant Colonel Rees of the OSI, my colleague Dr. Lincoln LaPaz has summarized thoroughly the nature of these incidents and, particularly, has noted the reasons why the objects concerned cannot be dismissed as ordinary meteoric phenomena. Dr. LaPaz is an extremely able man in the field of meteoritics and an enthusiastic, almost to the point of extravagance, investigator and worker. On the basis of the description at hand, I concur in his conclusions. Dr. LaPaz, who is "on location" and has observed at least one of these objects at first hand, should be fully supported in a continued investigation. Apart from the unusual appearance of the objects, the pattern of incidents is particularly striking. It would be exceedingly unlikely that so many meteors would appear in that small sector of the Southwest and nowhere else; if they did, they would not have consistently horizontal paths and

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head in a consistent direction. These points alone are sufficient to dismiss the meteoric hypothesis. It is entirely possible that, among the many incidents reported, one or two of the objects may have been fireballs, thus serving to confuse the issue, but a blanket explanation of that sort is improbable.

I would suggest that Dr. Jack Workman, Director of the New Mexico School of Mines, be contacted. He is conducting highly classified experiments in very high velocity projectiles and may be in a position to offer a worthwhile opinion. High velocity experiments, probably in connection with preliminary trials in the production of artificial meteors or artificial satellites, may prove to be the explanation of these incidents. Such experiments would not be conducted at any of the recognized air bases so far contacted.

Note: It has come to my attention since the writing of the above that Dr. LaPaz, in the March issue of Popular Astronomy (LVII, 3, p. 136) refers to "the spectacular meteoric display of 1948 December 5" in northeastern New Mexico. It would seem an unusual coincidence that the sightings reported in this incident occurred on the same evening and yet were entirely apart from it. The apparent contradiction is puzzling.

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Incident #224 -- near Las Vegas, New Mexico -- 8 December 1943

See report on incident #223 for detailed statement.

The present incident, if it were an isolated one, would be suggestive of a fireball, but, in view of significant differences and the general pattern of other related incidents, that explanation is improbable.

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Incident #225 -- near Vaughn, New Mexico -- latter part of 1947
3 or 4 November 1948
23 November 1948

It is difficult to ascertain whether the objects described in this incident belong to the general group of "New Mexico green flashes," or not. The description here is sufficiently different from the majority to indicate that they do not: the characteristic green color is not mentioned.

It is improbable, however, that the three separate sightings, all occurring at approximately 2200 hours and in the same locality, can be explained as astronomical phenomena. Furthermore, the stated altitude and distance are entirely out of keeping; this fact might be discounted as an illusion, common in the observation of fireballs, if the instance were isolated. The weight of the evidence, however, inclines to the conclusion that the objects were man-made devices and part of some scientific experiments, so common in that section of the country.

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Incident #228 -- Sandia Base, New Mexico -- 8 December 1948

See report on incident #223 for detailed statement. Again, it is more probable that the object seen is related to the "New Mexico green flashes" than that it was a fireball.

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Incident #227 -- near Bernal, New Mexico -- 12 December 1948

There is nothing that the present investigator can add to the detailed analysis given by the observer of this incident, Dr. Lincoln LaPaz.

See report on incident #223 for discussion.

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Incident #228, 228a

No information (other than the names of observers) concerning this incident has been received by the present investigator.

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Incident #229 -- South Bay, Florida -- 13 December 1948
229a -- Riviera Beach, Florida -- 14 December 1948

There seem to be two separate occurrences reported in this incident, and the information given for each is entirely insufficient for adequate analysis.

In #229, the location of the object in the sky is not given, nor is the hour of observation. The moon and Jupiter were visible in the early evening, the moon quite high, and Jupiter setting in the west. One might hazard a guess that Jupiter seen through a variable mist or high thin cloud coverage appeared to blaze up and die out. The larger planets often become momentarily spectacular when they are very near the horizon and the weather conditions are right.

#229a occurred at dusk, with the observers looking out over the ocean. The nearly-full moon was fairly high in the southeastern sky at that time; there might possibly be some connection between it and the object observed, if weather conditions were unusual.

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Incident #230 -- near North Powder, Oregon -- 4 August 1948

If it were not for the intense green color of this object, it would answer the description of a fireball. In view, however, of many similar occurrences in the New Mexico area, this interpretation is open to question. It should be noted that this incident occurred very much farther north than did the majority of the "green flashes," but that the observer was facing south. Nevertheless, considering the geographical difference, and the difference in season and in time of night of the observation, this object could very well have been a fireball. Insufficient evidence is offered to decide whether it belongs among the New Mexico objects or among the fireballs.

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Incident #231 -- Abilene, Texas -- 1 January 1948

This incident has no astronomical explanation.

The fan-shaped glow that extended momentarily from the horizon to the zenith suggests a man-made disturbance -- electrical or explosive. The green color is the only characteristic that might connect this incident with the "New Mexico green flashes"; the rest of the description does not.

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Incident #232 -- Demarest, New Jersey -- 16 November 1948

The information available concerning this incident is entirely insufficient to serve as a basis for analysis.

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Incident #233 — near Jackson, Mississippi — 1 January 1949

There is nothing in this incident that can be said to have an astronomical origin.

The object sighted is described as resembling a tow target, but with no towing plane seen. No one else reported seeing the object after this one sighting by several persons.

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Incident #234 -- Oak Ridge, Tennessee -- July 1947

Inasmuch as independent analysis has determined the object on the photographs to be a flaw, there is no need for further investigation. Object was never seen visually.

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Incident #230 -- Indiana County, Pennsylvania -- probably early December 1948

There appears to be no astronomical explanation for this incident.

The object seen was most likely a balloon.

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Incident #236 -- near Hickam Field, Hawaii -- 4 January 1949

There is clearly no astronomical explanation for this incident.

The account given seems trustworthy, even though only one person saw the circular disc. This report differs from many others in that the description of maneuvers executed by the object is definite, rather than hazy.

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Incident #237 -- Bourbon County, Kentucky -- 16 January 1949

There is some confusion as to whether the object or the smoke trail reported in this incident was visible for fifteen minutes. If the object itself was, it could not have been a meteor, but the gist of the report seems to indicate that only the trail was visible for any length of time. In that case, it could have been either the trail from a meteor or the vapor trail from an aircraft: the description is not sufficient to distinguish the two. Other observers (not those reporting the incident) indicated that the object was a high flying plane with a vapor trail, but this does not necessarily exclude the meteoric hypothesis, because of the general unfamiliarity of the public with such phenomena.

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Incident #239 — Phoenix, Arizona -- 24 October 1948

This incident as described is not amenable to any astronomical explanation. The object took 75 minutes to cross the sky.

The witness apparently is not a very critical observer (e.g., there could be no possible physical connection between the object's brightness and its apparent distance from a star).

The object could have been a lighted balloon; speed and maneuvers check.

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Incident #240 -- near Hood River, Oregon -- 11 December 1948

The gist of this incident is that a flash of light was seen and a continuing sound of explosion heard at about 7:30 on a rainy evening. Clearly this description could apply to any large explosion, such as that of an ammunition dump or factory; however, it is true that when a bolide explodes a blinding flash of light is seen, and thundrous sounds are sometimes heard for many seconds. Since the sky was overcast at the time of this incident, and a light rain was falling, the earlier part of the trail of the fireball (if that is what it was) was, of course, not visible; only the flash from the final explosion, which would have appeared essentially stationary, was seen.

In the absence of positive evidence of any other type of explosion occurring in that vicinity at the time, it is the opinion of this investigator that a bolide explosion was observed.

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Incident #241, a, b -- Los Alamos, New Mexico -- 20 December 1948

Dr. LaPaz, who has interviewed the various observers of this incident, has stated that the object seen was not a falling meteorite. He had access to more detailed information than is contained in the typed reports offered here, and he is an expert in these matters.

It should be noted, however, that the reports available to this investigator show many contradictions concerning the color and trajectory of the object: One observer gives the angle of fall as 45°; another states that the trajectory was horizontal. Most observers indicate a bluish-white light; only one mentions the color green, which is so predominant in the New Mexico "green flashes."

It is not at all certain that the object observed here belongs to the "green flash" family of incidents.

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Incident #242 -- Los Alamos, New Mexico -- 6 January 1949

The information offered concerning this incident is meager, and there was only one observer. According to the description, a brilliant green incandescent light was seen low on the horizon for about two seconds; speed was "high" but slower than that of a meteor. In view of this scanty evidence, no definite conclusion can be drawn.

If it were not for the fact that the incident appears to belong in the family of New Mexico "green flashes," the object could be considered to have been a slow meteor, even though the time of night of the sighting does not favor that hypothesis. It is much more probable, however, that this incident falls into the pattern of those dealt with in detail in the report on incident #223. See that report for further discussion.

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Incident #243 -- Los Alamos, New Mexico -- 28 December 1948

The object described here seems to belong to the mysterious family of "New Mexico green flashes." See report on incident #223 for detailed discussion.

It can be said, however, that, if this is regarded as an isolated incident, the description is not very different from that of a fireball. It is the occurrence of these incidents in a seemingly definite pattern that argues very strongly against the meteoric hypothesis.

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Incident #244 -- Kirkland Field, Albuquerque, New Mexico -- 12 November 1948

The evidence given concerning this incident does not hang together physically. If the object was a bright white light, diamond-shaped and two feet long, and only a third of a mile away, then it seems incredible that it should have been observed over only a 500' trajectory. And a bright light, that close, in a populated spot, surely would have attracted the attention of more than one person.

The whole report suggests a physiological optical illusion rather than a real object in the sky. The evidence is incomplete: time in sight is not stated, nor is the elevation or bearing of the object even implied. The manner of disappearance is not told: did the light simply go out abruptly, or did it fade out gradually, or what?

There is a remote possibility that the observer saw a daylight meteor over a very short part of its trajectory, but if this had been the case, there should have been some sort of a trail.

The method of reporting and interrogation in this incident is very poor. It would seem that if the observer was aware enough to note a length of 2' and a trajectory of 500', he would also have known the bearing and elevation of the object and its manner of disappearance.

The whole incident lacks a sense of physical reality.

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The preceding pages complete the analyses required to fulfill the terms of Contract No. W33-038-1118 (Ohio State University Research Foundation Project No. 364)

Note: In submitting this report it is understood that all provisions of the contract between The Foundation and the Cooperator and pertaining to publicity of subject matter will be rigidly observed.

Investigator J. Allen Hynek Date May 1, 1949

Laboratory Supervisor George W. Harding Date May 1-1949

For the Ohio State University Research Foundation

Executive Director James L. Owens Date 5/9/49
W.X.H.

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APPENDIX C-1

Headquarters Air Weather Service

Analysis of Incidents Nos. 1-172

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Authority NND 971337
By VH NARA Date 2/14/98
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B/Ltr from AMC
dtd 5 Jan 1949
Subj: Project
"SIGN"

AWS DSS 1st Ind 24 Jan 1949

HEADQUARTERS, AIR WEATHER SERVICE Andrews Air Force Base, Washington 25, D. C.

TO: Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio
ATTN: MCIAXO

Investigations by this headquarters reveal that a synoptic weather balloon could have been at the location where sightings were reported in the following incidents. In compiling this list consideration was given to the wind direction and speed at the surface and aloft at the scheduled time of balloon release, and the location of the nearest weather station making balloon observations.

2	52	91	126
3	72	93	148
4	73	94	155
25	78	105	166
28	81	113	169
36	87	115	172

FOR THE CHIEF AIR WEATHER SERVICE

/s/ W. A. West
W. A. WEST
Lt. Col., USAF
Adjutant General

2 Incls:
n/c

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HEADQUARTERS
AIR MATERIEL COMMAND
Wright-Patterson Air Force Base
Dayton, Ohio

MCIAXO-3/HWS/rm
Jan 5 1949

MCIAXO

SUBJECT: Project "SIGN"

TO: Chief, Air Weather Service,
Andrews Air Force Base,
Washington 25, D. C.
ATTN: DSS

1. Project "SIGN" is responsible for the collection, investigation and interpretation of data relative to sighting of unidentified flying objects. Attached Incident Summaries 1 thru 172 from the files of Project "SIGN" are forwarded for study and recommendations as to which of the incidents may be eliminated as balloons released on routine synoptic ascents by the Air Weather Service, the Navy Aerological Service or the United States Weather Bureau. The summaries attached may be retained in your headquarters for working and reference purposes.

2. The Air Weather Service is the only agency of its type that has been asked to assist in the accomplishment of Project "SIGN" except that the United States Weather Bureau has provided information on ball lightning. Research projects in which balloons are used and which are conducted or sponsored by the Army, Navy or United States Air Force are checked by the Intelligence Department of this Command. These checks areusually made direct from the Project "SIGN" Office, MCIAXO-3. These checks are distinct from the check of synoptic balloon flights made by weather service stations of the Air Force, the Navy and the Department of Commerce. (U. S. Weather Bureau) requested of Air Weather Service.

3. It is the opinion of this office that the below listed incidents are those having the greatest possibility of being balloons. This list does not eliminate the possibility that many of the remaining incidents are balloons.

2	24	50	91	113	155
3	25	52	92	115	156
4	28	72	96	126	157
11	30	73	104	141	159
14	31	81	105	148	163
16	32	87	107,8,9	151	167
22	33	89	112(See122)	154	169
23	48				

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Hq AMC, Chief, Air Weather Service, Washington 25, D. C.
Subj: Project "SIGN"

4. The form used in interrogating witnesses to sightings is inclosed as a matter of interest. Comment as to possible improvement of the "Essential Elements of Information" in regard to routine synoptic balloon flights is invited.

5. It is requested that correspondence be forwarded to the Commanding General, Headquarters, Air Materiel Command, attention MCIAXO-3.

FOR THE COMMANDING GENERAL:

/s/ W. R. Clingerman, Col, USAF
for H. L. McCOY
Colonel, USAF
Chief, Intelligence Dept

2 Incls:
Summaries 1-172 incl
"SEI"

Copies furnished:

AFOIR, Hq. USAF
Capt Trakowski, Geophysics Lab
Major Kodis, MCREEP
Colonel Neal, MCLAWS

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APPENDIX C-2

Headquarters Air Weather Service

Analysis of Incidents Nos. 172-233

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Incident #200, a, b, c -- Crescent City, California -- 17 October 1948

This incident has no astronomical explanation.

Although the four observers had no technical training, their reports are remarkably consistent. The object was in sight several minutes, too long to be a meteor; it made a banking turn of 45° and appeared to reflect sunlight very strongly. The speed was great but not excessive.

The object seen could have been an advertising blimp, a balloon, or an aircraft. The banking turn appears to rule out the balloon, unless this was a subjective impression caused by the turning of the balloon in the wind.

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Incident #201, a, b -- Army Air Base, Azores -- 31 October 1948

There appears to be no astronomical explanation for this incident.

The observers agree in the general description, but not in the speed of the object; speeds are given from 30 to 800 MPH.

The most likely explanation on the basis of the meager information offered is that the object was a balloon carrying a swinging light.

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Incident #202 -- Newark AF Base, New Jersey -- 8 November 1948

In everything but the luminosity, the object reported here answers to the description of a slow-moving fireball. Since it was in sight "one second or less," the first quarter moon and, presumably, the lights of the city and the airport, providing background and foreground illumination, may have tended to diminish the brilliance of the object. The time of day was most propitious for a slow-moving meteor. Unless a more likely explanation is forthcoming, this incident can be tentatively ascribed to the flight of a fireball.

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Incident #203 -- Alberta Province, Canada -- 17 November 1948

The object reported in this incident was certainly a fireball. The description fits very closely.

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Incident #204 -- Panama -- 8 November 1948

It seems entirely probable that the object sighted in this incident was the comet 1948L, which had been discovered two days earlier in Australia. The comet was suitably placed for observation near the equator and in the southern hemisphere. The time of observation also checks closely with the time of visibility. There is no single statement in the limited report that contradicts the comet hypothesis. If the observer had given the actual bearings of the object, these would have clinched the matter.

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Incident #205 -- Carthage, Missouri -- 31 October (?) 1948

The vague nature of the information reported in this incident and the inferred unreliability of the observer makes it difficult to take the incident seriously, especially since the observer has obviously jumped to conclusions on the basis of insufficient evidence.

However, if credence is given to the observations, either they must be placed with the group of "aluminum-colored objects," or, if liberal allowance is made for subjective impressions, one could stretch a point to say that a slow-moving fireball was seen. This hypothesis is far fetched, but the speed of the object and the time of day favor it. The fact that the observer stated that the object was aluminum colored actually means little, since he immediately identified it as a flying saucer, which he knew from newspaper reports to be such a color.

It is very difficult to deal with reports of untrained and unreliable observers, because they invariably see in an incident what they wish to be there.

From a purely physical basis, this investigator would prefer the meteoric hypothesis, even though the evidence is entirely insufficient to establish it.

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Incident #206 -- Clark AF Base, Philippine Islands -- 12 November 1948

Two things enter heavily into any possible interpretation of this incident: the reported maneuverability of the object, and the character evaluation of the witness.

If the facts are as stated, then there is no astronomical explanation for the object observed. A few points favor its having been a daylight meteor: the snow-white color, speed faster than that of a jet plane, roaring noise, similarity to "sky writing," and the time of day of the observation. The tactics, however, if really performed, oppose it strenuously.

The question is, did this object actually maneuver in and out of a cloud bank -- i.e., did it make turns of 180° or more? It is possible that such impressions were merely illusions. The witness saw the object intermittently through clouds. It is not clear whether he ever saw it against a cloud background or only in the sky background between clouds, a fact which is highly important. If he saw it only in breaks between clouds, this fact, coupled with its great speed, makes it clear that only momentary impressions could be obtained. Such observations, by an untrained observer, may bring forth a description that is extremely unlike the facts.

The impression of a fuselage with windows could even more easily have been a figment of the imagination.

Unless more specific information concerning this incident becomes available, the present investigator cannot say whether an astronomical explanation is possible, or not.

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Incident #207, a, b, c -- Andrews AF Base, Camp Springs, Maryland---
18 November 1948

There is no astronomical explanation for the object observed in this incident.

The similarity of the incident to #172 is striking, and it suggests a common origin for the objects. The two incidents were separated by a month and a half and by half a continent. The hours of observation were about the same. It may be significant that ground observers in each incident did not report the evasive tactics described by air observers, and it is tempting to hazard the guess that such tactics were largely the result of relative motion. It should be investigated whether a lighted balloon caught in the prop wash could give the appearance of a rapidly-maneuvering aircraft. In fact, this investigator believes that it would be an interesting experiment to have a typical lighted balloon engaged by aircraft at night, with a competent observer along to record apparent relative tactics of the balloon.

(It is not clear whether the two observers in this incident who reported evasive tactics were in the same plane, or not, but it is presumed that they were.)?

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Incident #208 -- Clark AF Base, Philippine Islands -- 17 November 1948

The limited information in the description of this incident can be explained as referring to the trail and explosion smoke left by a fireball. The white exhaust trail extending some one to ten miles, the "flak-like" terminal burst, the estimated altitude, and the color and time in sight all concur in ascribing this sighting to a fireball. The time of day of the observation is also in agreement.

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Incident #209 -- South Korea -- 4 November 1948

There is no astronomical explanation for this incident.

The object has been independently identified as a Soviet aircraft.

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Incident #210 -- Boston, Massachusetts -- 10 November 1948

There is no astronomical explanation for this incident. The objects seen were apparently conventional aircraft. It is rather surprising that, in the dim light, the observer could identify them as single-engine planes, and yet could hear no sound from them.

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Incident #211 -- Bellefontaine, Ohio -- 4 December 1948

There is no astronomical explanation for this incident, in view of identification of recovered materials as man-made. Apparently there has been independent identification of the object as a pistol flare fired from the ground.

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Incident #212 -- Dayton, Ohio -- 3 December 1948

Little can be determined from the scanty evidence concerning this incident. Two half-second pulses of light are apparently all that was seen. It is unlikely that any astronomical origin can be found for the object or objects observed, and certainly on the basis of so little information not even a guess can be hazarded.

See report on incident #213, which apparently refers to the same phenomenon.

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Incident #213 -- Dayton, Ohio -- 3 December 1948

This incident may represent the same phenomenon indicated in #212. The description here is more detailed.

The object could not have been a meteor, since observers state that it was in view several minutes and that it was rapidly ascending, and disappeared overhead.

The moon was at crescent phase, and this investigator has often seen it at this phase appearing through small breaks in overcast, at which time it gave the appearance of a bright light flashing on and off. At the time of this incident, however, the moon was in the southwest, whereas the observers state that their object was in the northwest. The altitude given does agree approximately with that of the moon.

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Incident #214 -- West Rindge, New Hampshire -- 7 July 1948

Inasmuch as the metallic particles concerned in this incident have been independently identified at MIT as parts of a cast-iron cylinder, an astronomical explanation of the incident is precluded. However, as a matter of general interest, it should be noted that iron meteorites could have produced the same effect. It is assumed, of course, that the MIT examination excluded the possibility of these particular particles being meteoritic.

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Incident #215 -- Fairfield Suisun AFB, California -- 3 December 1948

If the observations were exactly as stated by witnesses, this "ball of light" could not have been a fireball. However, astronomers receive such outlandish reports about fireballs that they are prepared for almost any kind of a story.

Even trained observers are sometimes greatly fooled by the illusion of closeness; cases are on record of fireballs which were reported to have fallen in adjacent fields, but actually came to earth some 200 miles away.

A fireball would not come into view at 1000' and rise to 20,000'. If this observation is correct, an astronomical interpretation for the incident can be ruled out. Under unusual conditions a fireball might, however, appear to rise somewhat, as a result of perspective as it slants into the earth's atmosphere.

Absence of trail and sound definitely does not favor the meteoric hypothesis, but, as in many other cases, does not rule it out with finality.

It does not seem likely that any known meteorological or auroral phenomenon would have been as bright as this object was reported to be.

In the almost hopeless absence of any other natural explanation, one must consider the possibility of the object's having been a meteor, even though the description does not fit very well.

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Incident #216 -- Chanute AF Base, Illinois -- 8 December 1948

A fairly bright, slow-moving bolide offers a good explanation for the object reported in this incident. The apparent rise can be explained as an effect of perspective. There is nothing in the description given that is contradictory to the bolide hypothesis.